

ATTENT COOPERATION TRE

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NOTIFICATION OF ELECTION  
(PCT Rule 61.2)

Date of mailing:

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in its capacity as elected Office

International application No.:

PCT/IT98/00149

Applicant's or agent's file reference:

3660

International filing date:

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Priority date:

Applicant:

TRINCA, Roberto

1. The designated Office is hereby notified of its election made:

in the demand filed with the International preliminary Examining Authority on:

15 October 1999 (15.10.99)

in a notice effecting later election filed with the International Bureau on:

2. The election  was

was not

made before the expiration of 18 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

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# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

|  |   |   |   |
|--|---|---|---|
| Applicant's or agent's file reference<br>3660  | <b>FOR FURTHER ACTION</b>   |   | See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416) |
| International application No.<br>PCT/IT98/00149  | International filing date ( <i>day/month/year</i> )<br>04/06/1998 | Priority date ( <i>day/month/year</i> )<br>04/06/1998 |   |
| International Patent Classification (IPC) or national classification and IPC<br>H04N7/15   |   |   |   |
| Applicant<br>TRINCA, Roberto   |   |   |   |
| <p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of 5 sheets.</p>   |   |   |   |
| <p>3. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> <li>I   <input checked="" type="checkbox"/> Basis of the report</li> <li>II   <input type="checkbox"/> Priority</li> <li>III   <input checked="" type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</li> <li>IV   <input type="checkbox"/> Lack of unity of invention</li> <li>V   <input type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</li> <li>VI   <input type="checkbox"/> Certain documents cited</li> <li>VII   <input type="checkbox"/> Certain defects in the international application</li> <li>VIII   <input type="checkbox"/> Certain observations on the international application</li> </ul> |   |   |   |

|  |  |
|--|--|
| Date of submission of the demand<br>15/10/1999   | Date of completion of this report<br><b>24. 03. 00</b>             |
| Name and mailing address of the international preliminary examining authority:<br><br>European Patent Office<br>D-80298 Munich<br>Tel. +49 89 2399 - 0 Tx: 523656 epmu d<br>Fax: +49 89 2399 - 4465 | Authorized officer<br>Luckett, P<br>Telephone No. +49 89 2399 8965 |



# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/IT98/00149

## I. Basis of the report

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

### Description, pages:

|             |                     |                           |            |
|-------------|---------------------|---------------------------|------------|
| 1,2,4-15    | as originally filed |                           |            |
| 3,3bis,3ter | as received on      | 08/03/2000 with letter of | 06/03/2000 |

### Claims, No.:

|           |                     |                           |            |
|-----------|---------------------|---------------------------|------------|
| 3,4,10-31 | as originally filed |                           |            |
| 1,2,5-9*  | as received on      | 08/03/2000 with letter of | 06/03/2000 |

### Drawings, sheets:

|         |                     |
|---------|---------------------|
| 1/2,2/2 | as originally filed |
|---------|---------------------|

2. The amendments have resulted in the cancellation of:

- the description,      pages:
- the claims,      Nos.:
- the drawings,      sheets:

3.  This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

see separate sheet

## III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

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the entire international application.

claims Nos. .

because:

the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):

the description, claims or drawings (*indicate particular elements below*) or said claims Nos. 1-31 are so unclear that no meaningful opinion could be formed (*specify*):

**see separate sheet**

the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

no international search report has been established for the said claims Nos. .

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**Re Item I**

**Basis of the report**

\* claims 2,5&9 part only, remaining parts as originally filed.

**Re Item III**

**Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

- 1 The applicants' detailed argumentation and extensive explanations, have been given full and careful consideration. However, it is still the case that the claims all lack clarity and conciseness (Art 6 PCT). The obscurity in the claims generally derives from the fact that they are composed of a list of vague desiderata, rather than a clear combination of technical features having a well defined inter-working relationship. Indeed the entire specification, notwithstanding the applicants' arguments to the contrary, also consists of a vague conflation of ideas loosely related to desirable features of a video conferencing system, many of which are already well known in the art and the remainder thereof relating to routine measures normally to be expected of a skilled person without the exercise of any inventive step, whether considered alone or in any particular combination.
- 2 The two figures accompanying the specification are also devoid of any real technical content, representing as they do, the vaguest of schematic representations of a central service provider linked to a plurality of subscribing stations, in a manner commonly known in prior art proposals for e.g. interactive TV/Internet services.
- 3 Thus the entire application appears to lack any clearly patentable matter.
- 4 In as far as their scope can at present be determined, and taking cognisance of the supportive arguments presented, it now appears that the claims all lack either novelty or inventive step having regard to the disclosure of D1 and D2 as follows:-

D1 = EP-A-0619679 (FUJITSU) -

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EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/IT98/00149

wherein, in a multi-location television conference system that connects five locations A, B, C, D, and E, when speeches take place at the four locations A, B, C, and D at the same time, at a listening location E, images of all the speaking locations A, B, C, and D are displayed on one screen with four divided screen areas. On the other hand, at the speaking location A, images of the speaking locations B, C, and D and an image of the former speaking location E are displayed on one screen with four divided screen areas. In addition, when images of speaking locations are displayed, locations names thereof are also displayed. Thus, a television conference held at a plurality of locations at a time can be smoothly managed as with a real conventional conference; and

D2: WO 98 23075 A (UNISYS CORP) 28 May 1998 -

in which a hub is disclosed for **multimedia multipoint video teleconferencing**. The hub has a plurality of input/output ports, each of which may be coupled to a communication channel for interchanging teleconferencing signals with remote sites. The hub includes a plurality of signal processing functions that can be selectively applied to teleconferencing signals so that the signals distributed by the hub **are in a form desired by the recipients or required by their equipment**. Signal processing may include video, data, graphics, and **communication protocol or format conversion, and language translation**. The hub may generate data relating to the use of its processing capabilities during a teleconference, so that accounting or billing for a teleconference may be based at least in part on which hub resources were used, the extent of their use, and the person desiring their use. **The identification of a signal processing function to be used during a teleconference may be automatically performed in response to the content of signals received at the hub during the teleconference.**

- 6 Beyond this state of the art, the minor linguistic or technical differences of the claims and/or the described embodiments, so far as these can at present be understood, do not appear to relate to any essential technical feature of an invention and therefore are not considered to imply an inventive step.
- 7 **Therefore, it does not appear that any aspect of the application could serve**

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**as a basis for a new allowable claim.**

A further disadvantage of the currently viable videoconferences, is given by the fact that it is not possible to superimpose titles, subtitles, abbreviations, speakers' names, musical themes and soundtracks, and all audio and video effects that can make of a "flat" and static videoconference a real television programme.

In this respect, it is useful to observe that said problems and drawbacks have not only got purely aesthetic consequences, but they also cause a rapid decrease in the level of attention of the attendants, which is an extremely important factor for the success of a conference of whatever type.

A first aim of the present invention is that of allowing the course of videoconferences (congresses, debates, presentations, lectures, etc.) with the utilization of audiovisual contributions such as films, slides, photographs, animated computer aided design, graphs, music and/or soundtracks etc.

A second aim of the present invention is that of guaranteeing an orderly and fluent course of a videoconference, thanks to the audio-visual commutations carried out by the operators of the direction room, and by the possible presence of a chairperson, who is meant to allow the user to personally take part in the debate, only at the most suitable moment.

A third aim of the present invention is that of giving the possibility to attend a conference even to Internet users. Furthermore, through a series of

## CLAIMS

1. Process for carrying out and managing videoconferences among remote and/or local users, characterised by the fact that it comprises the following steps:
  - 5 - link-up to a direction room (1) with a plurality of both remote and neighbour locations (2), which a signal of the audio video type (AV) originates at;
  - if necessary, conversion of the audiovisual signal (AV) from each location (2), before its transfer from 10 the place where it was generated to that where the direction room is located (1), so as to make it suitable to the type of connection and transmission which are being utilised;
  - Reconversion of the signal (AV) which has been 15 received, if this is necessary, into the audio video format, before its arrival at the direction room (1);
  - Selection of the signal or signals to use and send away to the attendants and the speaker respectively, by an input audio video matrix (MVi);
  - 20 - Addition of the contributions and the necessary audio and/or video effects, as well as of titles, soundtracks, comments, images, graphs and so on, by a video mixer or a computer having similar functions;
  - Selection of the processed audio video signals (AV) 25 and sending thereof to the several remote locations (2), according to the role that the users who are there located play at that moment (i.e. attendants or speakers).

2. Process according to claim 1, characterised by

suitable audio signal ( $A_1, A_2, \dots, A_n$ ) has been associated, i.e. the one that corresponds to the translation required by the user.

5        6. Process according to the preceding claims, characterised by the fact that more than one user can receive the same audio video signal (AV).

10      7. Process according to the preceding claims, characterised by the fact that it provides for the recording of the audio video signal for the purpose of archive or else, so well as it is actually seen by the attendants, that is enriched with the audiovisual contributions and the television effects that have been  
15 added, by a suitable videotape recorder (VD2) that receives the output signal of a video mixer (MIX) or computer with similar functions.

20      8. Apparatus for carrying out and managing videoconferences between remote and/or neighbour users, characterised by the fact that it comprises a plurality of remote and/or neighbour user-locations (2), of the interactive or multimedial type which are linked to a direction room (1) which exchanges a signal (AV) of the  
25 analog and/or digital audiovisual type with them.

30      9. Apparatus according to claim 8, characterised by the fact that said signal (AV) contains a series of information relative to the conference and the speaker or the speakers that are scheduled to talk, as well as

A further disadvantage of the currently viable videoconferences, is given by the fact that it is not possible to superimpose titles, subtitles, abbreviations, speakers' names, musical themes and soundtracks, and all audio and video effects that can make of a "flat" and static videoconference a real television programme.

In this respect, it is useful to observe that said problems and drawbacks have not only got purely aesthetic consequences, but they also cause a rapid decrease in the level of attention of the attendants, which is an extremely important factor for the success of a conference of whatever type.

It is also Known, from EP-A-0619679, a multi-location television conference system that connects five locations A, B, C, D, and E, when speeches take place at the four locations A, B, C, and D at the same time, at a listening location E, images of all the speaking locations A, B, C, and D are displayed on one screen with four divided screen areas. On the other hand, at the speaking location A, images of the speaking locations B, C, and D and an image of the former speaking location E are displayed on one screen with four divided screen areas. In addition, when images of speaking locations are displayed, locations names thereof are also displayed. Thus, a television conference held at a plurality of locations at a time can be smoothly managed as with a real conventional conference.

A first disadvantage of this conference system is

that it does not allow the connection among systems having different transmission protocols, different type of signals or different technologies.

A second disadvantage of EP-A-0619679 is that said limitations prevent the simultaneous connection and use of quite different transmission channels such as satellite, computer network, telephone lines, internet, and so on.

A third disadvantage of EP-A-0619679, is that the information that can be displayed on the screen of each user, by superimposition with the images of the most recent speaker/s, are very limited and require the use and the creation of identification codes.

A fourth disadvantage of EP-A-0619679 is the i it does not provide means for substitute the audio signal of one or more user with the audio signal coming from a simultaneous-translation room that translate, in real-time, the discourse of the speaker in that of the user.

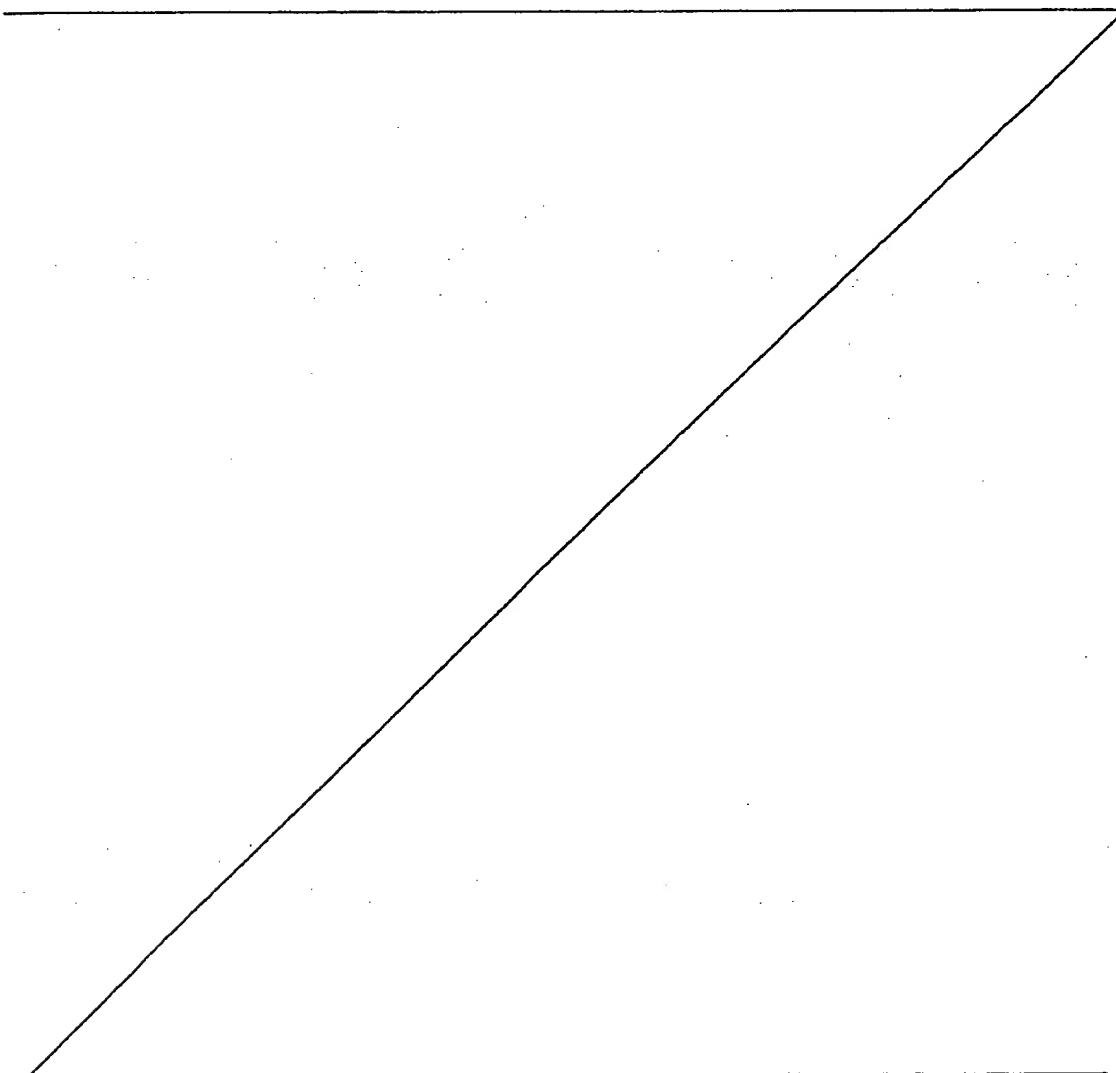
Another disadvantage of the system disclosed in EP-A-0619679 is that the switching of the images displayed is submitted to the detection of an audio signal.

A first aim of the present invention is that of allowing the course of videoconferences (congresses, debates, presentations, lectures, etc.) with the utilization of audiovisual contributions such as films, slides, photographs, animated computer aided design, graphs, music and/or soundtracks etc.

A second aim of the present invention is that of guaranteeing an orderly and fluent course of a

videoconference, thanks to the audio-visual commutations carried out by the operators of the direction room, and by the possible presence of a chairperson, who is meant to allow the user to personally take part in the debate, only at the most suitable moment.

A third aim of the present invention is that of giving the possibility to attend a conference even to Internet users. Furthermore, through a series of



CLAIMS

1. Process for carrying out and managing videoconferences among a plurality of users locations suitable to receive and transmit audio-video signals and located at whatever distance, using whatever communication protocol, characterised by the fact that it comprises the following steps:

- link-up a direction room (1) to a plurality of both remote and neighbour locations (2), where a signal of the audio video type (AV) is originated;
- conversion of the audiovisual signal (AV) from each location (2), before its transfer from the place where it was generated to that where the direction room is located (1), so as to make it suitable to the type of connection and transmission which are being utilised;
- Reconversion of the signal (AV) which has been received into the audio video format, before its arrival at the direction room (1);
- Selection of the signal or signals to use and send away to the attendants and the speaker respectively, by an input audio video matrix (MV1);
- Addition of the contributions and the necessary audio and/or video effects, as well as of titles, soundtracks, comments, images, graphs and so on, by a video mixer or a computer having similar functions;
- Selection of the processed audio video signals (AV) and sending thereof to the several remote locations (2), according to the role that the users who are there located play at that moment (i.e. attendants or speakers).

2. Process according to claim 1, characterised by

suitable audio signal (A1, A2, ..., An) has been associated, i.e. the one that corresponds to the translation required by the user.

6. Process according to the preceding claims, characterised by the fact that more than one user can receive the same audio video signal (AV).

7. Process according to the preceding claims, characterised by the fact that it provides for the recording of the audio video signal for the purpose of archive or else, so well as it is actually seen by the attendants, that is enriched with the audiovisual contributions and the television effects that have been added, by a suitable videotape recorder (VD2) that receives the output signal of a video mixer (MIX) or computer with similar functions.

8. Apparatus for carrying out and managing videoconferences among a plurality of users located at whatever distance and using whatever communication protocol, characterised by the fact that it comprises a plurality of remote and/or neighbour user-locations (2), of the interactive or multimedial type which are linked to a direction room (1) which exchanges a signal (AV) of the analog and/or digital audiovisual type with them.

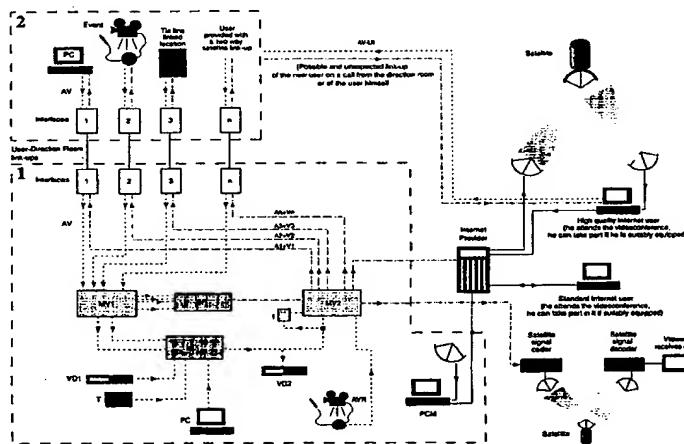
9. Apparatus according to claim 8, characterised by the fact that said signal (AV) contains a series of information relative to the conference and the speaker or the speakers that are scheduled to talk, as well as



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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| H04N 7/15   |   | (43) International Publication Date:   | 9 December 1999 (09.12.99)               |  |  |
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| (22) International Filing Date:                         | 4 June 1998 (04.06.98)  |  |  |  |  |
| (71)(72) Applicant and Inventor:                        | TRINCA, Roberto [IT/IT]; Via Casetta Mattei, 151, I-00148 Roma (IT).  |  |  |  |  |
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(54) Title: PROCESS FOR CARRYING OUT VIDEOCONFERENCES WITH THE SIMULTANEOUS INSERTION OF AUXILIARY INFORMATION AND FILMS WITH TELEVISION MODALITIES



(57) Abstract

Process for carrying out videoconferences among remote and/or local users, comprising the following steps: link-up to a direction room (1) with a plurality of both remote and neighbour locations (2), which an audiovisual signal (AV) originates at; if necessary, conversion of the signal (AV) from each location (2), before its transfer to the direction room (1), so as to make it suitable to the type of transmission being utilised; reconversion of the received signal (AV), if necessary, before its arrival at the direction room (1); selection of the signal or signals to use and send away to the attendants and the speaker respectively, by an input audio video matrix (MV1); addition of the contributions and the necessary audio and/or video effects, titles, soundtracks, graphs and so on, by a video mixer; selection of the processed audiovisual signals (AV) and sending thereof to the several remote locations (2), according to the role that the users play at that moment (attendants or speakers).

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PROCESS FOR CARRYING OUT VIDEOCONFERENCES WITH THE SIMULTANEOUS INSERTION OF AUXILIARY INFORMATION AND FILMS WITH TELEVISION MODALITIES

DESCRIPTION

The present invention relates to the field of multimedia communications, and more particularly a process and apparatus therefor for videoconferences that provides link-ups among several attendants and 5 with extremely variable characteristics and modalities, adaptable to any specific need of the user.

Currently, multiple user videoconference apparatus and techniques are known, and despite being based on different execution parameters, they make the choice of 10 the image to be shown to the attendants on the grounds of the audio signal coming from the attendants themselves, which is technically called "audio presence".

In other words, the sound received by the 15 microphone located at every equipped location gets to the centralised videoconference management device. This device shows all the attendants the image of the user that has generated the sound impulse. In such a way, all the attendants receive the image of the person 20 that is speaking at that precise moment of time on their screens. It is therefore clear that if two or more users speak at the same time, the conference management device carries out image commutations on a continuous basis, causing considerable disruptions and 25 chaos all along the course of the videoconference

itself.

Attention is also drawn to the fact that a user is allowed into a dialogue which has already started, even because of a background noise from his own environment,  
5 which could be completely independent from his will but is detected by the microphone located at his place.

Currently, in order to resolve such problems, it is necessary to turn off one's own microphone (but this risks turning an interesting debate into an endless  
10 monologue).

This type of automatic commutation caused by the audio presence, necessarily requires the presence of an interpreter next to each single attendant, in case of videoconferences that involve people speaking different  
15 languages.

Besides this, current technology does not always provide carrying out a link-up between different videocommunication systems. The apparatus which are currently being used in fact only allow file  
20 transmission and/or sharing just in case the link-up devices of the several attendants are made by the same manufacturer, in so doing drastically limiting the possibilities of employment of the system itself (file sharing, transmission and transfer, etc.).

A further problem of the prior art is given by the fact that the possibility of executing fadings among the images of the speakers that make their contributions along the way, and possible audio-video contributions, whether they be films, photographs,  
30 static images, graphs and so on, is ruled out.

A further disadvantage of the currently viable videoconferences, is given by the fact that it is not possible to superimpose titles, subtitles, abbreviations, speakers' names, musical themes and soundtracks, and all audio and video effects that can make of a "flat" and static videoconference a real television programme.

In this respect, it is useful to observe that said problems and drawbacks have not only got purely aesthetic consequences, but they also cause a rapid decrease in the level of attention of the attendants, which is an extremely important factor for the success of a conference of whatever type.

A first aim of the present invention is that of allowing the course of videoconferences (congresses, debates, presentations, lectures, etc.) with the utilization of audiovisual contributions such as films, slides, photographs, animated computer aided design, graphs, music and/or soundtracks etc.

A second aim of the present invention is that of guaranteeing an orderly and fluent course of a videoconference, thanks to the audio-visual commutations carried out by the operators of the direction room, and by the possible presence of a chairperson, who is meant to allow the user to personally take part in the debate, only at the most suitable moment.

A third aim of the present invention is that of giving the possibility to attend a conference even to Internet users. Furthermore, through a series of

procedures and suitable links, which will be analysed in detail in the foregoing, giving the possibility to any single spectator who is suitably equipped to directly enter and take part in the conference,  
5 contributing to it with his own image and his own audio (even if not originally scheduled).

A fourth aim of the present invention is that of guaranteeing compatibility between different videocommunication systems, utilising the most suitable  
10 interfaces and transforming the ensemble of the videoconference into many point-point links (user-direction) with personalised characteristics and communication protocols.

To this purpose attention is drawn to the fact  
15 that attendants, whether they be interactive or not, can be both remote and local and numberwise limitless.

These and other aims have been accomplished according to the invention, by proposing a process and an apparatus for the production and management of  
20 videoconferences, wherein audiovisual signals coming from a plurality of remote and/or neighbour locations, are acquired and elaborated by a direction room capable of dealing with and selecting both the audio and the video signal, adding audiovisual contributions like  
25 television effects, partial or total image superimposition, insertion of graphs, tables, films or soundtracks, audio commentaries, and so on.

According to the process and the apparatus which are herein described, it is also possible to provide a  
30 centralised interpretation service, discriminating on

the audio supplied by the users as a function of their language.

A better understanding of the present invention will be gained thanks to the following detailed 5 description with reference to the appended drawings, which schematically illustrate a preferred embodiment of the invention.

In the drawings:

Fig. 1 schematically illustrates the parts making 10 up the direction room according to the present invention;

Fig. 2 is a scheme illustrating the modalities and possibilities of link-up between the direction room and remote and/or neighbour users, by use of telephone 15 lines, via satellite, via Internet, and so on.

With reference to the abovementioned figures, the process object of the present invention comprises the following stages:

-link-up in a direction room 1 with a plurality of 20 remote and/or neighbour locations 2, which generate an audio video signal AV;

-conversion, if necessary, of the audiovisual signal AV from every location, before its transfer from the place where it is generated to that where the direction room 1 is located, to adapt it to the type of connection and transmission which is employed;

-reconversion of the received signal, if necessary, to an audio-video format, before its entrance to direction room 1;

30 -selection of the signal/s to be used and sent,

respectively, to the attendants and the speakers by an entrance audio-video matrix MV1;

-addition of the necessary audiovideo contributions and effects, as well as of titles, 5 soundtracks, commentaries, graphs, and so on, by mixer video MIX or computer with analogous functions:

-selections of the processed audiovideo signals and their forwarding to the several remote locations 2, as a function of the fact that at that moment they are 10 attendants or speakers.

According to a particular aspect of the process described above, while the attendants receive the audio video signal from the speaker, the latter will be capable of receiving a different audio signal which has 15 been selected by the direction room.

For example, the speaker will be capable of receiving an overview of all the attendants or of some of them, just by using a device that selects the desired signals from the signals AV of the several 20 locations and forwards them to the output audio video matrix for the following forwarding to the speaker.

Moreover, the speaker might have a graph that he is commenting to the attendants on his own screen, and these are bound to receive it full screen whilst seeing 25 the image of the speaker himself superimposed or occupying a portion of the screen itself.

A second advantageous aspect of the present invention is that it is possible to send audio signal A coming from the speaker to an interpretation room I, 30 wherein a simultaneous translation is carried out into

the languages required by the attendants.

The signal that is sent to each attendant therefore consists of the video signal ( $V_1, V_2, \dots, V_n$ ) ad hoc selected for him, to which a suitable audio signal has been associated ( $A_1, A_2, \dots, A_n$ ), therefore corresponding to the translation required by the user. It is obvious that more than one user can receive the same audio video signal AV.

Advantageously, according to the process that is herein described, it is also possible to record the audio video signal for an archive, just as it is watched by the attendants, that is with the audiovisual contributions and the television effects that have been added.

In so far as the apparatus apt to carry out the process so far described is concerned, within it there may substantially be envisaged a plurality of user-locations 2 (fig. 1), which are remote and/or local, and of the multimedial or interactive type, possibly equipped with a codifier/decoder, otherwise called CODEC, with an aggregator that transforms the analog audiovideo signal AV into a digital signal, and linked to a direction room 1 that exchanges a signal AV of the analog or digital audio visual type.

Said signal AV contains a bunch of information relative to the conference and the speaker or the speakers that are given the right to speak from time to time, as well as other auxiliary audiovisual information.

Said user-locations 2 comprise audio visual

input/output means, such as for example computer or multimedial stations, tie-line linked-up locations, while the signal transmission between said locations and the direction room, and vice-versa, can take place 5 regardless through (analog and/or ISDN) telephone lines, which can themselves be aggregate or not, satellite transmission appliances, data transmission networks (including Internet), and so on.

The signal from each remote location 2, whether it 10 be digital or analog, is converted into an audiovideo signal, while afterwards it is sent to an audio video matrix MV1 which deals with all the signals and gives one or more output signals.

From a strictly practical point of view, direction 15 room 1 simultaneously receives signals AV from all users 2 connected to the video conference, and it further controls the audiovideo synchronism in each single channel and, if necessary, it suitably modifies it (any possible lacks of alignment can be generated by 20 several components: transmission, channel aggregation, reconversion).

Signals AV coming from locations 2 are each visualised by a number of monitors and they are forwarded to audiovideo matrix MV1.

The signals which have been selected are sent to a 25 video mixer MIX, or computer with analogous functions, which is apt to act as an interface with a series of appliances like Personal Computers PC, Videotape recorders VD1, cameras, titlers T, audio equipment, and 30 so on.

According to a peculiar aspect of the present invention, the employment of such video mixer MIX advantageously provides the addition to or the superimposition onto the videoconference signal, that is the signal coming from the speaker, a series of audiovisual contributions such as titles, subtitles, musical themes, soundtracks, audio and video fadings, slides and/or graphs.

Furthermore it is possible to visualise the name 10 of the speaker that is talking in a certain definite moment, to carry out image superimpositions, to utilise and apply special effects and/or whatever other audiovisual contribution that makes the videoconference more versatile and adaptable to the needs of a specific 15 moment.

This means that it is also possible to superimpose, back up with or create effects between the image of the speaker and films that support his talk, or graphs that he is creating himself and/or changing 20 in that moment, and so on.

Advantageously, during a certain videoconference this makes it possible to emphasise moments of particular interest, and furthermore to underline relevant data during the talk, to highlight the aims to accomplish and/or particularly relevant news for the 25 topic which is being dealt with.

Thus, the audio video signal which has been elaborated by the video mixer MIX or by a computer with analogous functions, is forwarded to a second 30 audiovideo matrix MV2 and finally to a videotape

recorder VD2 which records the videoconference.

This second audiovideo matrix MV2, or visual signal sorting-out device, supplies the audio-video signals to be sent to each single user 2, whether they  
5 be remote or local.

The two input and output commutation devices of the direction room (audio video matrices MV1, MV2 or analogous devices) ensure a total compatibility between different videocommunication systems, through said  
10 plurality of CODEC or specific interfaces, so as to make it possible to carry out transmissions involving apparatus with technological features that made them incompatible so far. Moreover it is possible to use just one video matrix, if this is believed necessary by  
15 the direction room, in lieu of the two abovementioned ones.

As previously properly highlighted, another peculiar feature of the present invention is given by the fact that it is possible to capture audio signal A  
20 before it reaches output audio video matrix MV2, so as to make it possible to have a simultaneous translation by one or more interpreters into the language or languages used by the attendants if these explicitly showed a need for it or if they made a clear request to  
25 the organisation.

In other words, audio signal A that is sent into interpretation room I for translation is then associated to video signal V at the output of the second audiovideo matrix MV2 in real time, in such a  
30 way that the translation or the translations are

listened to by all the attendants that requested to be supplied with such a service.

Advantageously, according to the invention, direction 1 can intervene at any moment by using 5 audiovideo matrices, substituting audiovideo signal AV which is forwarded to one or more remote or local attendants 2 with audio video signal AVR, accomplishing an "intercom" type communication while the users who are not interested keep attending the videoconference 10 without any disruptions or interferences.

From what explained so far follows that signal AV which is elaborated by direction room 1 must be of the analog or digital audio video type: therefore the input and output signals, i.e directed to and coming from it, 15 which are not audio video, must be transformed before their employment and finally reftransformed at the very moment when they are to be sent to remote attendants in the analog or digital form.

These two input and output conversions at the 20 direction room, depend on the features of the link-up with the remote users, once again categorisable as digital or analogue, which can be carried out by means that the user believes more suitable: analogue, ISDN or aggregate ISDN telephone lines, satellite transmission, 25 computer networks (such as Internet for example), and so on.

From what described so far, it appears to be rather clear that all the attendants to the videconference receive the audio video signal from the 30 person that is speaking. Advantageously though, by

doubling all the incoming signals, on the speaker's screen there will be found to be shown the attendant to whom he is answering directly or with whom he intends to engage in a discussion, or in a cyclical fashion, 5 that is all the participants to the conference (one by one or by groups, resorting to audio video multi-signal simultaneous combination devices).

To said signal which is forwarded to the speaker another signal can be added or substituted, this latter 10 having been selected by the direction.

This is accomplished by a targeted or cyclical selection device SR, whose output signal is exclusively sent to the user that is at that moment playing the role of speaker, or otherwise to a group of users; this 15 is done by resorting to the second audio video matrix MV2 and whatever else is believed to be most suitable for that purpose by the direction.

It is useful to observe that a cyclical selection can take place at controllable time intervals, by dint 20 of a timer-programmer or a computer for example.

According to another peculiar feature of the present invention, the director has the possibility of selecting the speaker who is scheduled to talk at that moment and who will be shown full screen to all the 25 other speakers and/or attendants 2. Together with that, it is also possible to keep the audio channel of all or part of the attendants 2 active, enabling the apparatus to automatically visualise the participants that take part briefly and temporarily, in the form of 30 windows or pointers (spots) suitably placed on the

screen.

Another extremely advantageous aspect of the present invention is the possibility of transmitting the videoconference via Internet. By suitable 5 (aggregate or tie-line) connections between the direction room and the Internet provider, it is possible to broadcast the audio video signal AV of the videoconference, that comes from the audio-video output matrix MV2, and whatever Internet user.

10 Furthermore, by a suitable discussion group, each single user can ask questions, show examples and actively take part in the debate.

15 The chairperson or the person in charge of the videoconference will be capable of visualising all the communications of the final users or attendants, by a computer PCM connected to the same discussion group.

20 He will be capable of ascertaining whether they are worth being addressed to one of the speakers that will be then able to answer through the channels and the already described modalities of the videoconference.

If on the other hand the chairman will believe it suitable to personally let the Internet user UI contribute to the videoconference, direction room 1 is 25 capable of carrying out an unexpected but nonetheless possible telephone link-up AV-UI, turning the Internet user UI into an actor from spectator as he was, offering him a chance to come and take part in the conference just in the same manner as that given to the 30 other participants that are connected (provided that

said latecomer has the minimum equipment necessary for taking part in a videoconference which has the previously described modalities and features).

Advantageously, in the case of an Internet link-up, thanks to besides normal switch or ISDN telephone lines, the connection between the remote user and the provider can be carried out by dint of a mixed signal management system where the requests of the user are transmitted to the provider down the telephone lines, whereas the audio video signal of the videoconference or of the data which have been required can be received via satellite, leading to a drastic improvement of quality and increasing the speed of reception regardless of the traffic on the network and of the amount of users connected to it at that very moment.

Furthermore, using the Internet, it is possible to carry out transmission and data file exchange, regardless of the type of data therein contained, in a manner which is absolutely compatible with any type of computer or computer system.

Said remote or neighbour locations 2 may also comprise a camera and a microphone which are apt to send the audiovisual signal from a certain event like a parade or a sports match, to direction room 1 that is going to manage it in the most suitable manner.

According to the present invention, it is possible to conduct even very "intense" debates between a limited number of participants, avoiding frequent image changes; this is accomplished by subdividing the screen into adjacent windows and enabling the audio of the

entire discussion group. In this case there are found to be shown only those who are part of said restricted group of people on the screen and at the same time.

It is useful to notice that using CODECs, it is  
5 possible to control remote cameras based at locations  
2. This means that the staff in the direction room is  
capable of showing or zooming details at their own  
discretion, by sending suitable directions that are  
bound to be executed by the camera located at the  
10 user's location.

In particular cases, it is finally possible to envisage link-ups between direction room 1 and the users exclusively via satellite.

The present invention can also be applied to other  
15 fields such as: conferences, training and refresher  
courses, sales, advertising, consultancy services,  
tourism and others.

The present invention has been described and  
illustrated according to one preferred embodiment, but  
20 it holds that whoever skilled in the art may well amend  
or change it without stepping out of the scope of the  
present patent.

## CLAIMS

1. Process for carrying out and managing videoconferences among remote and/or local users, characterised by the fact that it comprises the following steps:

- 5 - link-up to a direction room (1) with a plurality of both remote and neighbour locations (2), which a signal of the audio video type (AV) originates at;
- if necessary, conversion of the audiovisual signal (AV) from each location (2), before its transfer from
- 10 the place where it was generated to that where the direction room is located (1), so as to make it suitable to the type of connection and transmission which are being utilised;
- Reconversion of the signal (AV) which has been received, if this is necessary, into the audio video format, before its arrival at the direction room (1);
- Selection of the signal or signals to use and send away to the attendants and the speaker respectively, by an input audio video matrix (MV1);
- 20 - Addition of the contributions and the necessary audio and/or video effects, as well as of titles, soundtracks, comments, images, graphs and so on, by a video mixer or a computer having similar functions;
- Selection of the processed audio video signals (AV)
- 25 and sending thereof to the several remote locations (2), according to the role that the users who are there located play at that moment (i.e. attendants or speakers).

2. Process according to claim 1, characterised by

the fact that while the attendants to the conference receive the audio video signal from the speaker, the speaker receives a different audio video signal which has been selected at the direction room (1).

5

3. Process according to claim 2, characterised by the fact that the speaker receives an overview of the attendants (2), or of some of them, by the employment of a targeted or cyclical selection device (SR) that selects the desired signals from the signals that arrive from the several locations, to further forward them to the output audio-video matrix (MV2), for their subsequent delivery to the speaker; said signals (AV) being capable of being simultaneously combined.

15

4. Process according to the preceding claims, characterised by the fact that the speaker is shown the graph that he is talking about to the attendants on his own screen, the attendants receiving said graph as a superimposition or within a section of the image of the speaker himself or vice-versa.

25

5. Process according to the preceding claims, characterised by the fact that it provides for the audio signal (A) from the speaker to be sent to the interpretation room (I) wherein a simultaneous translation into the languages required by the attendants is carried out; the signal which is sent to each attendant being therefore composed of the video signal (V1, V2, ..., Vn) selected for him, to which the

suitable audio signal (A<sub>1</sub>, A<sub>2</sub>, ..., A<sub>n</sub>) has been associated, i.e. the one that corresponds to the translation required by the user.

5        6. Process according to the preceding claims, characterised by the fact that more than one user can receive the same audio video signal (AV).

10      7. Process according to the preceding claims, characterised by the fact that it provides for the recording of the audio video signal for the purpose of archive or else, so well as it is actually seen by the attendants, that is enriched with the audiovisual contributions and the television effects that have been 15 added, by a suitable videotape recorder (VD2) that receives the output signal of a video mixer (MIX) or computer with similar functions.

20      8. Apparatus for carrying out and managing videoconferences between remote and/or neighbour users, characterised by the fact that it comprises a plurality of remote and/or neighbour user-locations (2), of the interactive or multimedial type which are linked to a direction room (1) which exchanges a signal (AV) of the 25 analog and/or digital audiovisual type with them.

30      9. Apparatus according to claim 8, characterised by the fact that said signal (AV) contains a series of information relative to the conference and the speaker or the speakers that are scheduled to talk, as well as

other auxiliary audiovisual information.

10. Apparatus according to claims 8 and 9,  
characterised by the fact that said user-locations (2)  
5 comprise audiovisual input/output means; signal  
transmission between said locations and the direction  
room, and vice-versa, taking place regardless via  
(aggregate or not, analog and/or ISDN) telephone lines,  
tie lines, satellite transmission devices, data  
10 transmission networks (including Internet), and so on.

11. Apparatus according to claims 8, 9 and 10,  
characterised by the fact that said remote locations  
(2) are equipped with analog/digital audiovisual signal  
15 conversion devices, said signal being then sent to the  
direction room (1) using suitable communication  
protocols according to the type of link which has been  
accomplished.

20 12. Apparatus according to claims 8,9,10 and 11,  
characterised by the fact that the direction room (1)  
simultaneously receives the respective signals (AV)  
coming from all the users (2) linked-up to the  
videoconference, transforms them into audiovisual  
25 signals by dint of said conversion devices and singly  
visualises them on a series of monitors; said signals  
(AV) are then channeled into an audio video matrix  
(MV1) that makes it possible to send just the signals  
coming from the speaker or speakers to the video mixer  
30 (MIX), in such a way that they are seen by all the

other attendants, with possible image fadings or other effects.

13. Apparatus according to claims 8, 9, 10, 11 and  
5 12, characterised by the fact that the signals (AV)  
selected by means of the audio video matrix (MVL) are  
forwarded to a video mixer (MIX), or a computer with  
similar functions, which is capable of interfacing with  
a number of appliances such as computers (PC), video  
10 tape recorders (VDL), cameras, titlers (T), audio  
equipment, and so on; said video mixer (MIX) making it  
possible to add to or superimpose onto the  
videoconference signal, that is to that from the  
speaker, a series of audiovisual contributions such as  
15 titles, subtitles, musical themes or soundtracks, audio  
video fadings, slides and/or graphs, visualising them  
full screen or on a portion thereof.

14. Apparatus according to claims from 8 to 13,  
20 characterised by the fact that it provides for the  
visualisation of the name of the speaker that is  
talking at a certain moment, for the carrying out of  
image superimpositions, for the use of special effects  
and/or whatever other type of audiovisual contribution  
25 that makes the conference more versatile and adaptable  
to the specific need of a certain moment; said  
apparatus further providing for the superimposition,  
the placing side by side or the creation of effects  
between the image of the speaker and of films backing  
30 up his talk, or of graphs that he himself is making or

changing at that very moment, and so on.

15. Apparatus according to claims from 8 to 14,  
characterised by the fact that the audio video signal  
5 (AV) as it is processed by the video mixer (MIX), or by  
a computer with similar functions, is sent to a second  
audio video matrix (MV2), or an analoguos audiovisual  
signal sorting-out device, that provides for the signal  
to be forwarded to each single user (2), regardless of  
10 whether they be remote or local.

16. Apparatus according to claims from 8 to 15,  
characterised by the fact that the two input and output  
commutation devices of the direction room (MV1, MV2)  
15 ensure a total compatibility between different  
videocommunication systems, by said plurality of  
conversion devices, so as to provide for the  
transmission between equipments that belong to  
technological realitites that have so far been  
20 incompatible.

17. Apparatus according to claims from 8 to 16,  
characterised by the fact that the audio signal (A) is  
captured before it reaches output audiovisual matrix  
25 (MV2), so as to make it possible to carry out a  
simultaneous translation by one or more interpreters  
into the language or languages of one or more users (2)  
that may require it.

18. Apparatus according to claims from 8 to 17,  
30 characterised by the fact that the audio signal (A)

that is sent to an interpretation room (I) for the translation, is subsequently associated to the video signal (V) exiting the second audio video matrix (MV2) in real time, in such a way that the translation or the 5 translations are respectively listened to just by all the users that make an explicit request for them.

19. Apparatus according to claims from 8 to 18, characterised by the fact that the audio video signal 10 (AV) as elaborated by the video mixer (MIX), or by a computer with similar functions, is forwarded to a videotape recorder (VD2) that records the videoconference.

15 20. Apparatus according to claims from 8 to 19, characterised by the fact that the direction (1) can take part in whatever moment, by replacing the audio video signal (AV) which is sent to one or more attendants (2), regardless of whether they be remote or 20 local, with an audio video signal of its own (AVR), accomplishing an "intercom" type communication while the users who are not interested keep following the videoconference without any disruption or interference.

25 21. Apparatus according to claims from 8 to 20, characterised by the fact that the signal (AV) which is elaborated by the direction room (1), is of the audio-video type: therefore the incoming signals from it that are not in the audio video format must be transformed 30 before their utilisation and possibly retransformed

into an analog or digital form at the moment of their forwarding to remote attendants; said input and output conversions at the direction room depend on the systems used and on the analog or digital features of the link-up, with each single remote user, which be accomplished by the means that the user believes to be most suitable: analog ISDN or aggregate ISDN telephone lines, tie-lines, satellite transmissions, computer networks (e.g. Internet), and so on.

10

22. Apparatus according to claims from 8 to 21, characterised by the fact that all the attendants to the videoconference receive the audiovisual signal selected by the direction, of the person that is talking, while on the speaker's screen there is found to be visualised the attendant to whom he is answering directly, or with whom he intends to discuss, or, in a so called cyclical fashion, all the attendants to the conference (one by one or in groups); for this purpose, the doubling of all the incoming signals (AV) being provided.

23. Apparatus according to claim 22, characterised by the fact that said selection of the signal sent to the speaker is obtained by dint of a video matrix and a cyclical visualisation device, with the possibility of simultaneously combining more than one audiovisual sources, controlled by a timer-programmer or by a computer; the resulting signal being only sent to the speaker and/or some particular users, by the output

vodeo matrix (MV2), if the direction believes it necessary.

24. Apparatus according to claims from 8 to 23,  
5 characterised by the fact that, according to schedule or else, the director can select the speaker who is scheduled to talk, who is bound to be visualised to all the other attendants to the conference and or spectators.

10

25. Apparatus according to claims from 8 yo 24,  
characterised by the fact that keeping the audio channel active of all or part of the attendants to the conference (2), this makes it possible to automatically 15 visualise the participants that take part temporarily and briefly, by the employment of windows or spots.

26. Apparatus according to claims 8 to 25,  
characterised by the fact that thanks to suitable 20 (aggregate or tie-line) link-ups between the direction room and an Internet Provider, it is possible to transmit the audiovisual signal (AV) of the videoconference, that comes from the outgoing audio video matrix (MV2), to any Internet user.

25

27. Apparatus according to claim 26, characterised by the fact that by a suitable discussion group, any single user can ask questions, show examples and actively take psrt in the debate; a chairperson being 30 capable of visualising on his own monitor all the

communications between the final users or spectators by a computer, and of ascertaining whether to turn them to one of the speakers that can answer using the channels and modalities of the videoconference which have  
5 already been described.

28. Apparatus according to claim 27, characterised by the fact that if the chairperson on the other hand believes it suitable to let an Internet user (UI) take part in the debate, the direction room (1) is capable of carrying out an unexpected but viable telephone link-up (AV-UI) turning the Internet user into an "actor" from being a "spectator", and offering him the possibility of getting to take part in the videoconference just in the same fashion as the other attendants who are already connected (with the proviso that the latecomer is sufficiently equipped for taking part in the videoconference with the modalities and features which were previously described).  
10  
15

20

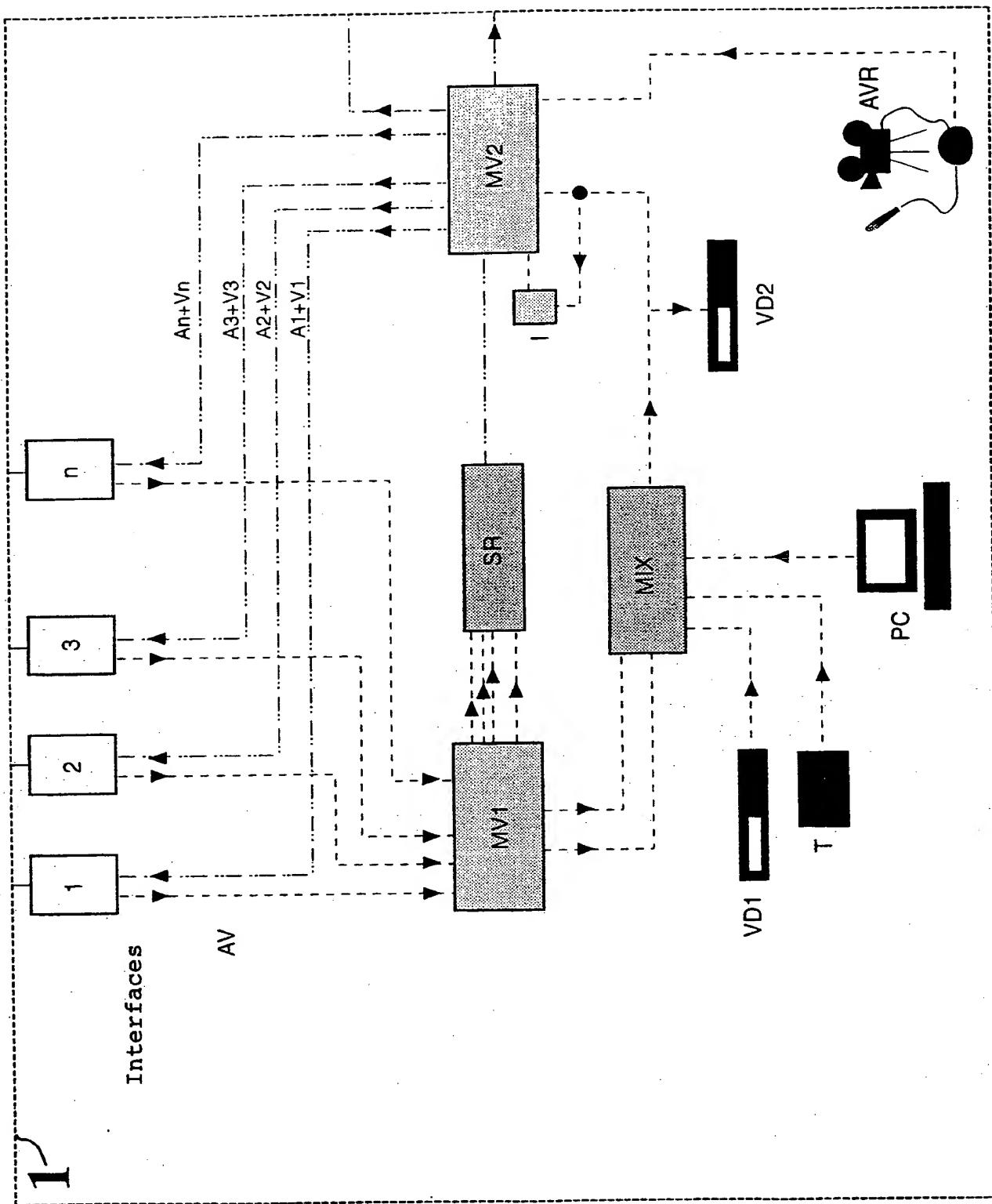
29. Apparatus according to claims 8 to 28, characterised by the fact that in case of an Internet connection, besides by normal switch or ISDN telephone lines, the link-up between remote user and provider can take place thanks to a mixed signal management system where the requests made by the user are transmitted to the provider by telephone, while the audio video signal relative to the videoconference or the data which have been requested can be received via satellite,  
25  
30 drastically augmenting the quality and the reception

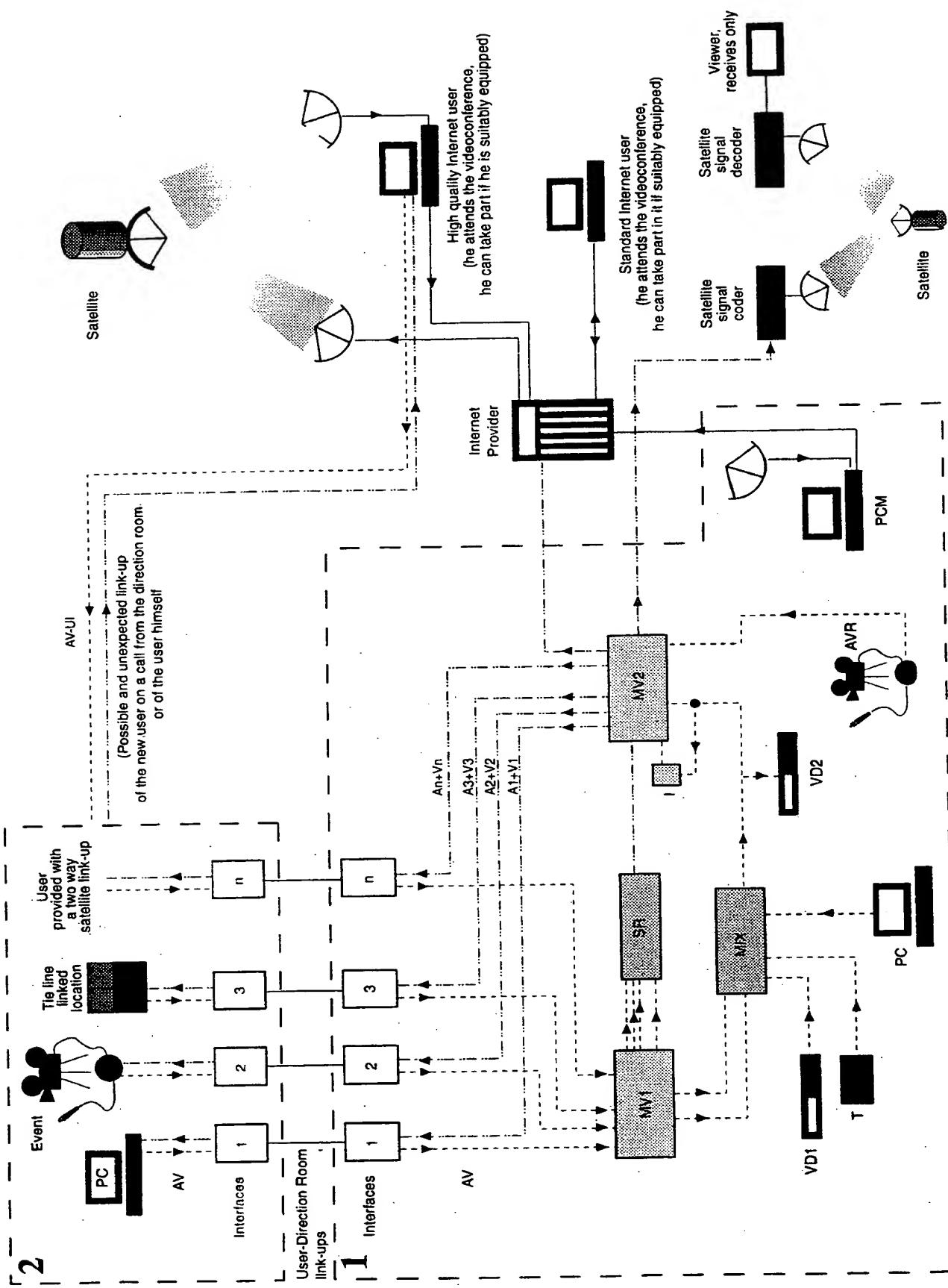
speed, regardless of the traffic on the network and of the amount of users who are connected at that moment; it being further possible to carry out the transmission and the data file exchange whatever type they are, in a manner which is absolutely compatible with whatever type of computer or computer system.

30. Apparatus according to the preceding claims, characterised by the fact that said remote or neighbour locations (2) can also comprise a camera and a microphone which are apt to forward the audiovisual signal that comes from an event, a parade, sports events or else, to the direction room (1), which is going to use it in the most suitable way.

15

31. Apparatus according to the preceding claims, characterised by the fact that the connections between the several locations, whether they be remote or local, and the direction room, are managed by dint of the normal known link-up procedures that can be by means of a telephone line carrier, by direct phone calls, by Internet network, via satellite, tie-lines, and so on.





# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/IT 98/00149

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC 6 H04N7/15

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 H04N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

| Category | Citation of document, with indication, where appropriate, of the relevant passages   | Relevant to claim No.                        |
|----------|--|--|
| X        | EP 0 619 679 A (FUJITSU LTD)<br>12 October 1994  | 1-3, 6, 8,<br>9, 12-15,<br>22, 23,<br>25, 30 |
| Y        | see column 1, line 25 - column 2, line 31<br><br>see column 6, line 7 - line 12<br>see column 7, line 54 - column 8, line 50<br>see column 12, line 7 - line 44<br>see column 20, line 40 - column 21, line 42<br>see column 23, line 33 - line 35<br>see column 41, line 45 - column 43, line 57<br>see abstract; figures 1,2,11<br>--- | 4, 5, 7,<br>20, 26-29                        |

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

\* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority, claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

18 February 1999

Date of mailing of the international search report

05/03/1999

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## INTERNATIONAL SEARCH REPORT

In international Application No

PCT/IT 98/00149

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document, with indication, where appropriate, of the relevant passages  | Relevant to claim No. |
|----------|---|-----------------------|
| Y        | EP 0 632 659 A (AT & T CORP)<br>4 January 1995  | 4                     |
| A        | see column 1, line 23 - column 2, line 15<br><br>see column 3, line 31 - line 38<br>see column 8, line 5 - line 42<br>see abstract<br>---   | 1,8,9,<br>12-14       |
| X        | WO 98 23075 A (UNISYS CORP) 28 May 1998   | 8-11,17,<br>18,21,31  |
| Y        | see page 3, line 12 - line 25   | 5                     |
| A        | see page 6, line 11 - page 12, line 16<br>see abstract; figure 4<br>---   | 1,16                  |
| X        | US 5 710 591 A (WEBER ROY P ET AL)<br>20 January 1998   | 8,19                  |
| Y        | see column 3, line 19 - line 40   | 7                     |
| A        | see column 4, line 44 - column 5, line 40<br>see column 6, line 32 - line 46<br>see abstract; figure 1<br>---   | 1-3,22,<br>23         |
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